Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

Claims 1- 28 (cancelled).

29. (New) A homogeneous method for determining the chemosensitivity of cells towards at least one substance in a sample by measuring the apoptosis induced by the at least one substance comprising the steps of:

- incubating the cells essentially concurrently with at least one marker whose specific binding capability to phosphatidylserine can be detected and with the at least one substance, and
- detecting the binding between the marker and phosphatidylserine as a function of time in the sample.

30. (New) The method according to claim 29 further comprising the steps of adding to the cells the at least one marker together with the at least one substance prior to and/or during the incubation of the cells.

31. (New) The method according to claim 29, wherein the cells are animal cells.

32. (New)The method according to claim 31, wherein the cells are leukemia cells, cells of solid tumors, or cells of pathologic organs.

33. (New) The method according to claim 29, wherein the cells are reference cells.

34. (New) The method according to claim 33, wherein the reference cells are from non-pathological organs or from healthy regions of pathological organs.

35. (New) The method according to claim 29 further comprising the steps of performing a reference measurement without the addition of the at least one substance.

36. (New) The method according to claim 29 wherein the at least one substance is selected from the group consisting of pharmaceutically active substances, chemotherapeutic agents, environmental pollutants, peptides, nucleic acids and derivatives thereof, peptide nucleic acids, and nucleic acid hybrids.

37. (New) The method according to claim 29 wherein the at least the marker is selected from the group consisting of antibodies, Fab fragments, single-chain antibodies, aptamers, and other proteins having binding sites for phosphatidylserine.

38. (New) The method according to claim 29 wherein the said marker comprises a dye portion, a colloidal precious metal, a radioactive isotope, rare-earth metal chelate or a combination, thereof.

39. (New) The method according to claim 29 wherein the detecting step distinguishes apoptotic cells from necrotic cells.

40. (New) The method according to claim 39 further comprising the steps of co-incubating the cells with a marker for necrotic cells.

41. (New) The method according to claim 40 wherein said marker is a dye interacting with nucleic acids which cannot permeate intact cell membranes.

42. (New) The method according to claim 29 wherein detecting is performed by an imaging method.

43. (New) The method according to claim 42 wherein the imaging method comprises fluorescence detection.

44. (New) The method according to claim 42 wherein comprises confocal or conventional microscopy.

45. (New) The method according to claim 29 further comprising the steps of standardizing the number of cells identified as apoptotic for the total number of cells.

46. (New) The method according to claim 29 wherein the detecting step is performed with a time resolution of hours or at greater time intervals.

47. (New) The method according to claim 29 wherein the marker is annexin V in the presence of calcium in a concentration range of from 0.1 to 30 mM.

48. (New) The method according to claim 47 wherein the calcium concentration range is from 1 to 10 mM.

49. (New) The method according to claim 29 used for screening for apoptotically effective substances.

50. (New) A kit useful in performing a homogeneous method for determining chemosensitivity of cells, the kit comprising

a) at least one cytostatic agent present as a dry substance, in solution, or in the presence of a matrix substance and

b) at least one marker having a detectable interaction with phosphatidylserine,

wherein the homogeneous method for determining the chemosensitivity of cells towards at least one substance is performed by measuring the apoptosis induced in a cell sample by the at least one substance, said measuring comprising the steps of:

- incubating the cells essentially concurrently with at least one marker whose specific binding capability to phosphatidylserine can be detected and with the at least one substance, and
- detecting the binding between the marker and phosphatidylserine as a function of time in the sample.